DOCUMENT RESUME

ED 412 998 JC 970 554

AUTHOR	Larson, John C.; Garies, Ruth S.; Campbell, William E.
TITLE	A Profile of MCPS Graduates and Their Performance at Montgomery College.
INSTITUTION	Montgomery Coll., Rockville, MD.
PUB DATE	1996-05-00
NOTE	34p.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Community Colleges; Comparative Analysis; *Developmental Studies Programs; Grade Point Average; High School Graduates; High Schools; *Outcomes of Education; *Student Characteristics; Success; *Two Year College Students; Two Year Colleges
IDENTIFIERS	Montgomery College MD; Montgomery County Public Schools MD

ABSTRACT

A joint study was undertaken by the Montgomery County Public Schools (MCPS) and Montgomery College (MC), in Maryland, to determine the characteristics of MCPS graduates enrolled at MC and patterns in their developmental course placement. Data were collected for 13,575 MCPS graduates from 1992 and 1993 who enrolled in regular semester terms within 1 year of graduation. In addition, data on first-year outcomes were collected for 2,041 MCPS graduates who enrolled at MC in both the fall and spring terms following graduation. The study found that the MCPS graduates enrolled at MC were more likely to have received special education services and English as a Second Language instruction than MCPS graduates in general. Approximately 7% of these graduates had taken higher math and honors English courses and were not required to take any developmental math courses. However, the almost 55% who had taken only intermediate algebra and 12th-grade English had a 1-in-3 likelihood of taking a developmental course at MC, while the almost 40% who had taken no math higher than geometry and senior English courses below grade level took MC developmental math courses at a rate exceeding 90%. Finally, the mean grade point average at MC for the 1992 graduates was 2.26, compared to 2.15 for 1993 graduates, while both classes successfully completed only three-quarters of their credit hours. Recommendations for improvement and data tables are included. Contains 10 references. (BCY)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 412 998

A Profile of MCPS Graduates And Their Performance At Montgomery College

May 1996

A Collaborative Research Project Between

Montgomery County Public Schools
Paul L. Vance, Superintendent

Montgomery College
Robert E. Parilla, President

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

R. S. Garies

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

JC 970554

BEST COPY AVAILABLE

A Profile of MCPS Graduates And Their Performance At Montgomery College

by

John C. Larson
Department of Educational Accountability
Montgomery County Public Schools

Ruth S. Garies and William E. Campbell
Office of Planning & Institutional Research
Montgomery College

May 1996

ACKNOWLEDGEMENTS

The authors would like to thank many people who contributed to this research collaboration since its inception in September 1994. The joint work group was formulated after initial meetings between Superintendent Paul Vance and President Robert E. Parilla. Mary Helen Smith of MCPS coordinated the early planning meetings. Jim Darr at MC and Milt Wilkerson at MCPS were instrumental in the early phases of extracting, compiling and merging student data from the two institutions. Several staff members contributed to the planning sessions and commented on earlier drafts of the report, including Sherman Helberg, Paula Matuskey and Maggie Schmid-Wenning of MC as well as Kathy McGuire and Marlene Hartzman of MCPS. Robert Edwards assisted in the student analysis at MCPS.

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1

- Overview of Findings
- Recommendations

II. BACKGROUND 6

III. COMPARING STUDENT PROFILES OF ALL MCPS GRADUATES WITH MONTGOMERY COLLEGE ENROLLEES 10

- Economic Status of Graduates and Enrollees
- Special Services
- Demographic Patterns
- High School English and Math Preparation
- College Board Testing Experience

IV. STUDENT DIFFERENCES IN LIKELIHOOD OF DEVELOPMENTAL COURSE PLACEMENT 14

- Findings on Math Placement
- Findings on Reading Placement
- Findings on English Placement

V. FIRST YEAR PERFORMANCE OF STUDENTS AT MONTGOMERY COLLEGE 21

- Overall Success
- Demographic Differences in Success
- High School Academic Preparation
- Placement Test Performance
- Additional Comments on Testing

SECTION I

EXECUTIVE SUMMARY

OVERVIEW OF FINDINGS

MCPS students who prepare seriously for college have a very low risk of being recommended for developmental courses if they were to enroll at Montgomery College. This group, comprising approximately the top quarter of seniors, takes precalculus or higher math in high school, earns high SAT scores and participates in honors English courses. Among this group virtually no students were recommended for developmental math courses.

However, for another approximately one-quarter of the seniors, high school graduation does not necessarily translate into college readiness. MCPS students who defer taking challenging courses face a high likelihood of taking developmental courses if they were to enroll at Montgomery College. This group pursues high school math courses no higher than geometry, does not take the SAT, and often takes an English course in the senior year that is below grade level. Among this group the placement rate in developmental math courses exceeded 90 percent.

The remaining roughly one-half of the MCPS seniors who have studied intermediate algebra or trigonometry, taken at least some 12th grade English courses and have earned SAT scores relatively close to the national average, faces approximately a 1-in-3 likelihood of taking a developmental math, English or reading course if they choose to attend Montgomery College.

This pattern of findings is of increasing concern to the country's labor force at a time when the supply of well-paying jobs is dwindling for those without collegiate training. Virtually all job growth areas of the future, even those in trade and technical fields, require at least some post-high school preparation.

Racial/ethnic group or gender make very little difference in the likelihood of developmental course-taking at Montgomery College for students who share similar high school course-taking profiles. However, It should be noted that course taking patterns differ considerably among the different racial groups. A greater proportion of African American and Hispanic students enroll in less rigorous high school courses than do White students. Where racial differences in developmental course placement occur, those differences are largely due to corresponding racial differences in high school course-taking and academic performance.

About 22 percent of MCPS graduates from Spring 1992 and 1993 enrolled at Montgomery College as regular students in the academic year following their graduation. However, the three broad groups of students described above were not equally represented among those who enrolled at Montgomery College. For example, the top group of students, representing about 28 percent of the graduating class, comprised about 7 percent of the Montgomery College enrollees from MCPS. The middle group of about 45 percent of the MCPS graduates made up about 55 percent of the Montgomery College enrollees. The lower

group, representing about 27 percent of MCPS graduates comprised close to 40 percent of the Montgomery College enrollees. Thus, although the majority of the students from MCPS who come to Montgomery College come from the middle group of high school graduates, these differences indicate that there are many MCPS graduates bound for Montgomery College who are, on average, less well prepared for college than are their classmates attending college elsewhere.

In order for a Montgomery College student to receive credit towards a degree for a math course, the math course must be at least at the level of intermediate algebra. This is consistent with the State's General Education requirements. Courses below that level, (e.g. geometry, basic algebra) are termed "developmental" and, while students pay tuition for such courses, they earn no credits towards graduation nor will they be accepted on transfer to four-year colleges and universities. Similarly, if a student's reading level is tested below the 11th grade level or if composition skills are not at the college level, then the student is recommended to take a non-credit developmental reading or English course.

Student placement rates into developmental courses vary considerably, not only by the student's academic preparation as noted above, but also by college of attendance. For example, the Maryland Student Outcome and Achievement Report (SOAR) conducted by the Higher Education Commission showed that the developmental placement rate of 1994 MCPS graduates varied widely across different colleges throughout Maryland. These differences were largely related to college differences in the criteria for developmental course placement, because some institutions had lower developmental rates than other campuses despite significantly lower SAT averages than those other campuses. Among all of 18 Maryland's community colleges, the developmental placement rates at Montgomery College were close to the median values found statewide; slightly lower in English and math, slightly higher in reading. Published studies from throughout the US also suggest that the criteria for developmental placement vary significantly from one college to another, and perhaps over time within a single institution.

Despite these inconsistencies among institutions in defining developmental requirements, this study shows that MC students identified as needing developmental placements tend to experience more academic difficulties at MC. These students tend to be those who had not planned on attending college (i.e. had not taken the SAT), who scored lower than average on the SAT if they had taken it, and who had completed only the lower levels of math or English courses in high school. For example, during their first year at MC their mean grade point average is lower than a "C" (2.0), they drop the greatest number of hours, and they earn the smallest percentage of hours attempted. These findings lend support to the Montgomery College's new policy that requires more extensive testing and placement of incoming students.

RECOMMENDATIONS

Focus student attention on college readiness.

In light of the strong link between high school academic course work and college readiness, MCPS should explore ways to make students aware of the importance of taking a challenging course of study and performing well. Such efforts should start in the middle schools well before students begin planning for the transition into high school. Efforts to strengthen the course selections of minority students, who tend to enroll in the less challenging high school courses, are critical to improving their readiness for college work. For students of any race group, each successively higher level of course completed in high school decreases the risk of developmental course placement, even for students who at first may not be planning to attend college. After all, one out of four seniors who did not take the SAT, thus may not have been pursuing college plans seriously, did in fact enroll as a regular student at MC within one year after graduating. Students planning on college attendance should pursue a course of study in high school that culminates in the senior year with at least the study of English 12: Essay/Lyric 2 and Narrative/Drama 3 or higher and, in math, Algebra 2 or higher. Students headed for college who, for example, have studied math no further than geometry should plan on spending more time and money on course work before beginning to earn credits toward a college degree.

Procedures for raising the students' awareness of the importance of college preparation could include, for example, providing a sample of a placement test in the high school's media center so that, say, 10th or 11th graders could periodically check on their college readiness. Also, as part of ninth graders' four-year plan, students should be provided with a college readiness card on which they track each semester's progress through specific math, science and English courses as well as their plans for and performance on PSAT and SAT and a schedule of college application and financial aid activities. Perhaps a brief summary of the results of this study could also be made available to high school students as they pursue their four-year plans. High school staff should also point out that students who place into developmental courses at MC do not possess the skills needed for employment identified by the U.S. Labor Secretary's Commission on Achieving Necessary Skills (SCANS) report.

Parents need to understand the importance of their children's course selection and performance to the likelihood of success and the cost of completing college. Joint programs convened by MCPS, MC, and other colleges could be offered throughout the county to increase parental awareness.

Provide more directive counseling at college registration.

Since academically at-risk students tend to drop more courses after the start of the term and successfully complete fewer courses, MC should provide them with more directive counseling, including mandatory enrollment in skill development courses, so that they do not incur heavy courseloads for which they may not be prepared. Moreover, many of the students who drop courses for which they have already paid can least afford the loss of those ill-spent tuition dollars.

Encourage dialogue among faculty of high schools and colleges to clarify instructional goals, align curricula and coordinate student support systems.

Some contact between college and high school faculty occurs on an informal basis at this time. Such efforts could be exanded to include, for example, increased participation of high school teachers in MC's Center for Teaching and Learning, collaborative workshops on curriculum and instruction, possibly faculty exchange days, or other methods for teachers and administrators to appreciate more fully the instructional processes and educational demands of the entire community.

Expand the policy debate concerning options for students meeting only the minimal high school graduation requirements.

Students who earn a high school diploma by completing just the minimal graduation requirements are not necessarily prepared for college-level course work. This has always been true. However, with a national economy that demands a more technically-trained work force, and with corporations and businesses providing only low-level wages for those not technically trained, these prespective employees will not flourish in the marketplace. The nation trains its workforce through public schools at public expense, through higher educational institutions with combinations of personal and public expenses, and through businesses at private-sector expense. More public debate is needed to encourage collaboration among the public sector, private sector, legislative bodies as well as individual families and communities to enhance the education and training of our next generation.

Re-examine course placement criteria.

In light of the variability from one college to the next in developmental course placement criteria and policies, MC should periodically review its criteria for developmental course recommendations. For example, MC should study the success rate of students recommended for developmental courses who nevertheless proceed without taking those courses, and the success rate in the developmental courses of students so placed. Both MC and MCPS should join with the Maryland Higher Education Commission and the Maryland State Department of Education in a study to determine the reasons for variability in the developmental course placement rates at colleges throughout Maryland. MCPS should use results from such a study to provide students with fuller information on the levels of readiness expected at different institutions.

Expand the study of MCPS graduates.

It is important to understand the persistence towards a college degree of MCPS graduates, and the present study analyzed only the experience through the first year of college after graduation from MCPS. For example, important questions for further study could include:

- What percentage of students at various levels of high school preparation return for a second year of college at MC?
- How many years does it take students who did or did not take developmental courses to complete an Associate's Degree, or to transfer successfully to a four-year institution?
- How do student study habits and part-time jobs affect their high school preparation for college and their performance while attending college?
- How does performance at four-year colleges throughout Maryland compare with that at MC for students with similar levels of high school academic preparation?
- Do recent changes in MCPS graduation requirements alter the developmental rates found at MC?
- Will the new State testing requirements reduce the number of MCPS graduates who read, compute, and write below nationally recognized levels of minimum college entry skills?

Answers to such questions could help MCPS to shape high school preparation and MC to shape counseling for undergraduate study.

SECTION II

BACKGROUND

Montgomery County, Maryland is a 500 square mile area bordering the nation's capital on the north. The county's population of approximately 800,000 is highly educated with 55 percent of the adult population holding an A.A. or higher degree, compared to 24 percent nationally. The median household income level in 1990 (about $62,000) ranked seventh among counties nationwide. The expectation of many among this highly educated citizenry is for students to continue their education beyond high school. With the release of the U.S. Labor Secretary's Commission on Achieving Necessary Skills (SCANS) report and its emphasis on the need for graduates seeking employment to have an understanding of technology, mathematics, and the ability to communicate effectively, more high school graduates have sought post-secondary opportunities.

A recent report on the Class of 1992 from the National Center for Educational Statistics (NCES) estimated that nationwide about 73 percent of seniors planned to continue into higher education in the next year. Local data (Griffith, 1994) showed that 87 percent of the Montgomery County Public School seniors in the 1992 annual High School Senior Exit Survey reported plans to attend post-secondary programs (66 percent in 4-year institutions and 21 percent in 2-year or technical schools.) Of the students in MCPS going on to college, approximately 22% of 6900 in 1992 and 6600 in 1993 enrolled in the regular fall or spring academic terms at Montgomery College within one year after graduation.

Recent demographic changes in Montgomery County have brought greater socioeconomic diversity to the area. Despite the reputed affluence of Montgomery County, 30 percent of the 1995 student body had received free or reduced meal service at some time in MCPS. The student population is currently 19% African American, 12% Asian American, 11.5% Hispanic, .5% American Indian and 57% White, whereas in 1968 the public school population was 93.5% White.

Demographic changes in the school population and changes in the job market have affected the types of programs being offered in Montgomery County Public Schools and Montgomery College. For example, it was necessary to provide English for Speakers of Other Languages (ESOL) services in only two elementary schools in 1968. In the 1994-95 school year ESOL services were provided in every elementary and secondary school to a total of 7,500 students. Montgomery College offered a developmental program during that earlier time period consistent with the academic needs and college instruction at that time, while today the college offers a full range of developmental and ESOL classes on all three campuses.

Montgomery College has an open-admissions policy and, like most institutions with open admissions policies, is committed to providing the necessary assistance for students who may not be totally prepared for college level work. A recent review of college reading courses (Wyatt, 1992) emphasized that underprepared students are not necessarily unable. Montgomery College recognizes this and offers developmental programs for these underprepared students. However, as noted by Roueche and Roueche (1993), academically at-

risk students are more likely to ignore placement test results and previous school performance in selecting courses. They enroll in courses beyond their skill levels. Increasingly, institutions are turning to mandatory placement to ensure proper placement in needed developmental courses. Roueche and Roueche stated that this is one of the most significant factors in improving students' probability of success. Recently, Montgomery College adopted a policy requiring students with weak reading skills to enroll in developmental reading courses. Mandatory enrollment in developmental English and math courses for underprepared students will be phased in over the next few years.

Students with inadequate preparation for college must spend extra time and tuition dollars in developmental courses. Since tuition dollars do not fully support college budgets, developmental coursework also incurs additional social costs. For example, at the University of Maryland, College Park student tuition accounted for less than 30% of the Fiscal 1996 cost of instruction. At Montgomery College student tuitions paid approximately 36% of the cost of instruction while state and local taxes comprised 59% of the revenues.

The proportion of instructional hours and, thus, of costs, devoted to developmental education has been increasing. For Montgomery College as a whole, between fall 1991 and fall 1995 the enrollment in the developmental courses increased by over 14%, to 15,032 hours, or 9 percent of the college's total hours of enrollment. The estimated cost for these courses in Fiscal 1995 was $5,920,000, or nearly 9 percent of total expenditures. Learning support centers add to this total.

Offering developmental classes for underprepared students at a college level is not a new phenomenon, according to Wyatt. In 1894, Wellesley established developmental courses and Harvard, Princeton, Yale and Columbia followed suit in 1907 when more than one-half of their enrolled students failed to meet entrance requirements

By the 1991-92 school year, the NCES estimated that 91 percent of the nation's two-year colleges offered developmental courses, up from 84 percent in 1981. Over that same time period the percentage of four-year institutions offering developmental programs rose from 79 percent to 89 percent. Generalizable estimates on the percentage of students needing remediation are more difficult to obtain. The difficulty in reaching generalizable statements about student remediation rates is due to institutional variations in four conditions: (1) availability of different types of developmental courses; (2) differences in the average academic levels of college programs; (3) differences in performance levels or tests required for developmental course referrals; and, (4) differences between colleges in the academic preparation levels and background conditions among their entering students.

For example, according to the Maryland Higher Education Commission[1], 29 percent of the 1994 MCPS graduates who entered the University of Maryland-College Park enrolled in developmental math classes, but none in developmental reading or English. Yet, at another

[1] MHEC determines the remedial placement rate by comparing the number of recent high school graduates whose test performance places them in developmental courses to the total number of such students enrolled, whether they completed placement testing or not. This results in a lowered remedial placement rate since it implies that all students not tested possess college-level academic skills.

smaller campus whose entering students from MCPS averaged one standard deviation lower on SAT Math than the College Park sample, only 5 percent were placed in developmental math courses.

The Maryland Higher Education Commission also reported variability at the community college level. For example, among the 18 community colleges in Maryland, the percentage of recent high school graduates needing developmental work in English ranged from 12 percent to 71 percent with the median value being 31.5 percent. In math, the 18 community colleges ranged between 10 and 74 percent in their placement rates of recent high school graduates into developmental courses. The median value was 50 percent. In reading, between 2 and 67 percent of the recent high school graduates needed developmental reading. The median was 21.5 percent. Among Maryland's community colleges, Montgomery College's developmental placement rates in English, math, and reading are quite close to the median placement rates; slightly lower in English and math, slightly higher in reading.

Other reports of remediation rates from campuses around the country vary considerably. For example, 40 percent of a recent group of students entering Temple University took courses in their English Language Enrichment Center (Hayes, 1995). That same author cited a report that about 20 percent of students from northern Virginia high schools require remediation in either math, reading or English. Other writers (Sommerfeld, 1995) report that nearly half of students entering the California State University system are not ready to take college-level English or math, and that system enrolls only the top one-third of high school seniors. Sommerfeld also noted that while the California system's freshman SAT Math average remained at nearly 484 since 1989, the percentage of students not ready for college-level math rose from 29 percent to 47 percent. This shift may suggest a change in academic requirements within that university system. Finally, a recent study of developmental placement practices at 15 southern universities (Abraham, 1992) found nearly 125 combinations from among 75 different tests for assessing reading, writing and math. These considerations make it difficult to generalize any finding on remediation rates from one student sample to another, or from one college to another.

Other studies suggest the need for further examination of developmental placement decisions. Sturtz and McCarroll (1993) reported that a sample of community college students who were recommended to take a developmental math course but nevertheless took the college-level math course experienced almost as high a success rate in course completion (67 percent) as did similar students who succeeded in the developmental math course as recommended (79 percent.) Similarly, while 72 percent of the students recommended for Basic (developmental) English completed that course successfully, 68 percent of the students who were recommended for Basic English but nevertheless took the regular English composition course succeeded. The current study did not examine the extent to which such findings may apply to MC or other state institutions. However, these findings suggest a need for colleges to monitor continuously and improve both their testing processes and their course requirements. As part of a recent revision in the student testing and placement policy, MC has undertaken a study of the success rate of students placed into developmental courses.

The current study examined the developmental course placements of recent MCPS graduates at MC. In a collaborative effort between the two institutions, student high school records and demographic data were combined with college enrollment, test and course placement data. This unique data set provided:

- A profile of all MCPS seniors as well as that subgroup that enrolled in MC;
- An examination of how developmental course placements were influenced by high school course taking, academic performance, and relevant demographic indicators; and
- A report of students' first-year course-taking at MC.

Results from this study will be used to support high school course selection decisions, to reinforce instruction in specific high school reading, math and English courses, and to review placement practices and course offerings at the college.

SECTION III

COMPARING STUDENT PROFILES OF ALL MCPS GRADUATES WITH MONTGOMERY COLLEGE ENROLLEES FROM MCPS

MCPS students who graduated in 1992 or 1993 and enrolled at MC during the following year represented a fair cross-section of MCPS seniors by gender and race. However, those MC enrollees as a group tended to have taken fewer high-level academic classes than was true for the entire group of MCPS seniors. Also, the MC enrollees tended to have experienced somewhat higher levels of socioeconomic and educational need than was true for the entire MCPS group of graduates. About 22 percent of the MCPS seniors enrolled in MC as students in a regular academic term during the first year after their high school graduation from the Class of 1992 or the Class of 1993. An additional 7 percent of the MCPS graduates enrolled at MC for summer courses only. However, this analysis is limited to the large group that enrolled in at least one of the regular sessions. This section details the similarities and differences between the high school graduates and the MC enrollee groups in order to provide a broader context for interpreting the levels of developmental course placements reported below in Section 4.

METHOD

The data files from the MCPS graduating classes of 1992 and 1993 were matched against the MC data file to determine which students from those graduating classes enrolled in one of the regular semester terms at MC within one year of graduation, (referred to in Table 3-1 as the fiscal year 1993 or fiscal year 1994 at MC.) Records for a total of 13,575 seniors were extracted from MCPS data for those two years. Students enrolling more than a year after graduation were not included in this analysis. Demographic indicators such as race, gender, age, special services and level of academic courses in high school were studied.

RESULTS

Economic Status of Graduates and Enrollees

Despite the reputed affluence of Montgomery County, the data reported in Table 3-1 suggest that old stereotypes of the suburban school district are becoming outmoded. The 14 percent of 1992 and 1993 seniors who had free or reduced meals services indicates that many families lived close to the poverty line. Typically, this figure reported for secondary school students under-estimates the near-poverty conditions in families compared to similar data reported for elementary students. More recent data from fiscal year 1995 show that 29 percent of MCPS students either received in 1995, or in some earlier year, the free meals service. Statewide in Maryland the percentage of students qualifying for free or reduced meals was 28 percent in 1993 and 29 percent in 1994 (Maryland School Performance Report 1994).

Table 3-1 shows that, among the MC enrollees from MCPS in fiscal year 1994, more than one student in five (22 percent) had received free or reduced meals services in high school. That figure for fiscal year 1993 enrollees was 16 percent. These data suggest that many MCPS students whose family economic situations are marginal enroll at MC.

Special Services

About one out of three MCPS graduates had received some special education services while students in MCPS. (These services are for the relatively milder conditions at intensity levels 1, 2, or 3.) [2] The figure among the MC enrollees noted in Table 3-1 was just over 40 percent. Thus, students who may have encountered some learning difficulties in MCPS tend to be over-represented among the MC enrollees.

Also, students who had received English for Speakers of Other Languages (ESOL) services while in MCPS tended to be represented more among MC enrollees (e.g. 23 percent in 1994) than among all graduates (16 percent.) ESOL services are provided for students who enter MCPS without adequate command of English. Usually such students receive two or three years of supplemental instruction in English.

Demographic Patterns

Gender distributions among MC enrollees were similar to that found among MCPS graduates as a whole, approximately 49 percent females. Approximately one student out of three among the MC enrollees was older than grade-age (i.e. older than 18 years upon graduation), compared to a figure of 27 percent for all MCPS graduates. White students were proportionally represented in the MC group for 1993 (59 percent) but were slightly underrepresented among the 1994 MC enrollees (54 percent.) Hispanic students were slightly over-represented among MC enrollees (10 to 11 percent) compared to their representation among all seniors (8.5 percent.) African American and Asian American students enrolled in MC in proportions very similar to their representation among all MCPS graduates.

High School English and Math Preparation

Seniors are required to have four years of English in order to graduate, but the highest level of English course attained need not be at the 12th grade level. For example, students who took ESOL classes or developmental English early in high school may not reach 12th grade English by graduation. Nevertheless, the large majority of MCPS graduates took at least some 12th grade English course while a senior. Table 3-1 shows that less than 10 percent of the graduates took an English course no higher than the level of 11th grade, and the MC enrollee groups had essentially that same pattern. The FY93 group of MC enrollees appeared to have taken more 12th grade courses (64 percent) than did the FY94 group (48 percent), and a corresponding difference was also found between the two cohorts of the total group of MCPS seniors. However, at the

---

2 Special education services here means that at some point in their MCPS years the student received intensity level 1, 2, or 3 services. Intensity 1, for example, means only one hour per week while intensity 3 indicates 5 to 15 hours per week of direct intervention.

upper level of the curriculum about 14 percent of all graduates took some honors or advanced placement English course (grade level 13 in Table 3-1) while only about 2 percent of the MC enrollees took senior English courses at that advanced level.

Math course-taking shows a similar pattern. About 27 percent of all seniors graduate with math courses at or below the level of geometry while over 36 percent of the MC enrollee group graduate with math courses at a level no higher than geometry. It should be noted that college level math begins at the level of algebra 2 according to the state's General Education Requirements. Table 3-1 also shows that about 50 percent of seniors graduate having taken math at the level of trigonometry or higher, compared to about 27 percent of the MC enrollees.

These data show that the MC enrollees have, on average, taken a less rigorous academic program in high school than have many other MCPS graduates.

College Board Testing Experience

Table 3-1 shows groups with four different experiences on the SAT:

- Those who did not take the SAT;
- Those who scored less than one standard deviation (SD) below the national average of 902 on the total score;
- Those who scored within one SD of the national average; and
- Those who scored higher than one SD above the national average.

Although the MC enrollees participated in SAT-taking (67 percent) almost as much as did the total group of MCPS seniors (72 percent), the two groups differed considerably in their score distributions. Close to 40 percent of the total MCPS graduates as well as the MC enrollees scored within one SD of the national average. However, about one out of four MC enrollees scored more than one SD below the national average while about one out of 10 MCPS seniors scored that low. Or, 2 to 3 percent of the MC enrollees scored more than one SD above the national average while 22 percent of the total MCPS group scored that high.

In conclusion, these test data, together with the academic course data, show that many MC enrollees tend to have lower levels of academic preparation than do many other MCPS seniors. Although a substantial number of these students have the academic preparation and financial resources typical of public school graduates, many are less prepared academically and financially. This profile of students is consistent with the community college's mission of open access and moderate tuition.

Table 3 - 1
Comparison of Demographic Background and Academic Preparation
of All MCPS Seniors and Montgomery College Enrollees.

	MCPS CLASSES OF 1992 AND 1993		MC 1st-time, regular FY93		MC 1st-time, regular FY94	
	n =	% of Group	n =	% of Group	n =	% of Group
GROUP TOTALS	13575	100.0%	1559	100.0%	1420	100.0%
GENDER						
Female	6621	48.8%	765	49.1%	698	49.2%
Male	6954	51.2%	794	50.9%	722	50.8%
RACE						
Am. Indian	35	.3%	4	.3%	4	.3%
Asian Am.	2148	15.8%	229	14.7%	235	16.5%
African Am.	2213	16.3%	251	16.1%	253	17.8%
White	8023	59.1%	919	58.9%	771	54.3%
Hispanic	1156	8.5%	156	10.0%	157	11.1%
OLDER THAN GRADE?						
On grade-age	9867	72.7%	1064	68.2%	951	67.0%
Older student	3708	27.3%	495	31.8%	469	33.0%
ESOL SERVICE						
None	11466	84.5%	1272	81.6%	1093	77.0%
Prior Svc.	2109	15.5%	287	18.4%	327	23.0%
SPEC.ED. SERVICE						
None	9192	67.7%	933	59.8%	799	56.3%
Prior Svc.	4383	32.3%	626	40.2%	621	43.7%
FREE/REDUCED MEALS						
None	11618	85.6%	1310	84.0%	1107	78.0%
Prior Svc.	1957	14.4%	249	16.0%	313	22.0%
HIGHEST ENGLISH						
9th Grade	587	4.4%	70	4.5%	80	5.7%
10th Grade	210	1.6%	38	2.5%	25	1.8%
11th Grade	220	1.7%	24	1.6%	31	2.2%
11 & 12th Grade	3873	29.3%	387	25.1%	566	40.1%
12th Grade	6520	49.3%	983	63.7%	680	48.2%
Honors/AP Courses	1804	13.7%	41	2.7%	30	2.1%
HIGHEST MATH						
Below Alg 1	901	6.7%	91	5.8%	78	5.5%
Alg 1	745	5.6%	90	5.8%	91	6.4%
Geometry	2106	15.7%	443	28.4%	349	24.6%
Alg 2	2837	21.2%	509	32.7%	505	35.6%
Trig	3150	23.5%	304	19.5%	295	20.8%
Precalculus	1557	11.6%	81	5.2%	72	5.1%
Calculus	2104	15.7%	40	2.6%	30	2.1%
SAT GROUP						
No SAT	3742	27.6%	515	33.1%	470	33.1%
1 sd below USA	1437	10.6%	368	23.6%	351	24.7%
within 1 sd of USA	5395	39.8%	635	40.8%	566	39.9%
1 sd above USA	2992	22.1%	40	2.6%	33	2.3%

SECTION IV

STUDENT DIFFERENCES IN LIKELIHOOD OF DEVELOPMENTAL COURSE PLACEMENT

A student's participation in rigorous academic courses, doing well in class work and performing well on the SAT are the most important determinants of the likelihood for developmental course placement in college. Virtually none of the top quarter of the graduating class would, if they enrolled at MC, be recommended for developmental course placement in math.

On the other hand, the lowest quarter of the graduating class that had not studied math higher than the level of geometry and many of whom had not taken a college preparation test faced a near certainty of developmental course placement. They had not prepared themselves in high school to begin the study of advanced algebra (the lowest level of math course for which they could receive credits toward a college degree, according to State General Education requirements.)

The approximately middle half of the MCPS graduates would, if they were to enroll at MC, face about a one-in-three chance being recommended for a developmental math course, depending upon the quality of their course work in algebra 2 or trigonometry. A similar relationship was found between academic preparation in English and the likelihood of developmental course placement in reading or English composition. Overall, however, the likelihood of placement in developmental reading or English was lower than that for math.

Demographic differences among students, such as racial/ethnic type or history of participation in free or reduced meals, ESOL or special education influence the likelihood of placement into developmental courses. However, by far the most important indicator of likelihood for developmental placement are the students' levels of academic preparation. Most racial/ethnic or other demographic differences in developmental placement appear due to racial or other group differences in academic preparation.

These estimates for the entire graduating class come from studying the developmental placement rates of the 1992 and 1993 MCPS graduates who enrolled at MC and took a placement test for math, reading or English. Since only about half of the MC enrollees took a placement test in either math or English, we needed some method of estimating the likelihood of developmental course placement of the other half of the students. We analyzed how the tested group's senior year course-taking, academic grades, and SAT scores influenced their developmental placement rates at MC. Based on that information we estimated the likelihood of developmental placement for all seniors with various profiles of English or math courses, class marks and SAT scores. It is important to formulate estimates for the entire MCPS graduating class because, as noted above in Section III, the group that enrolls at MC and the subgroup that takes the placement tests are not a representative cross-section of the senior class. We review below the estimated rates of placement into developmental math, reading or English courses, and the various academic and demographic factors associated with these estimates.

METHOD

Subjects

All graduating seniors in 1992 and 1993 (N = 13,575) were included in this analysis. About 72 percent of the seniors in these graduating classes took the SAT while in high school. The mean total score of 992 for the class of 1993 places the academic quality of this urban-suburban school district considerably above the national average SAT score of 902. The racial/ethnic composition of the senior classes was 59 percent white, 16 percent African American, 16 percent Asian and 9 percent Hispanic. (These percentages for seniors vary slightly from the total system enrollments reported above in Section II.) At some point during their enrollment in the school district, 15 percent of these students had received ESOL services and 14 percent had received services for free or reduced meals while in high school. (The free meals benefit provides an approximate indicator of the student's exposure to near-poverty conditions.)

Of those attending MC, roughly half completed the placement tests. Students scoring below specific thresholds established by MC are advised to enroll in the appropriate non-credit, developmental math, reading or English courses. Students not prepared to study intermediate algebra are recommended to take developmental math courses. Students who test below an 11th grade reading level are recommended to take developmental reading, and those unable to meet college composition standards are recommended for developmental English composition courses. Course taking, academic performance and demographic data from students' high school careers were merged with these college developmental placement results for this analysis.

Analysis

Developmental placement rates among the 2,737 graduates who enrolled at the community college and were required to take a placement test were examined. Differences in high school course taking and performance were then examined as precursors of developmental placement rates among the tested group. Specifically, differences in developmental placement rates were analyzed for groups whose high school experiences differed as follows: highest level of math or English course taken in senior year; class mark earned in that course; and, SAT Verbal and Math scores. Percentages of developmental students were observed among the combinations of course level, class marks and SAT scores. Appropriate proportions were then attributed to similar high school graduates who had attended the community college, but were not tested as well as to other seniors. This design fairly represents the likelihood of developmental course placement for all seniors regardless of their college enrollment status. These estimates were used in the analyses presented below.

Differences in estimated developmental placement rates for math, reading and English were then examined for the 10 types of student groups summarized in Table 4-1:

- College enrollment status
- Gender
- Graduating class
- Racial/ethnic group

- Prior free meals service
- Prior ESOL service
- Highest level of English in high school
- Prior special education service
- Highest level of math in high school
- SAT-taking

RESULTS

Findings on Math Placement

The estimator model predicted that about 4 in 10 MCPS graduates would place into developmental math courses. However, the summary in Table 4-1 shows wide variability in the likelihood for developmental math placement across groups of students with differing levels of academic preparation. Across the two cohorts, 60 percent of the MCPS graduates who were tested at MC, and subsequently enrolled in the regular term, needed to take developmental math courses. This group comprised about one-fifth of the MCPS graduating classes from 1992 and 1993. Note that the summer-only enrollees had a considerably lower estimate of developmental placement. Of those enrollees who were not tested about 43 percent would likely be recommended for developmental math courses if they were to be tested, based on their senior year math course, class marks and SAT scores. Among other seniors with SAT scores (thus presumably college-bound) who did not enroll at MC, about 22 percent would require developmental math courses. For the students with no SAT score, about 84 percent would require developmental study in math if enrolled at MC. Recall from Table 3-1 that about one-fourth of those students actually enrolled at MC even though their lack of an SAT score would suggest that they had not fully planned to attend college.

Regarding other academic background factors, Table 4-1 shows that virtually no calculus or precalculus graduates would require developmental math courses. On the other hand, 57 percent of the students who had studied intermediate algebra as seniors would require developmental placement at MC, and over 90 percent of those who had reached no further than geometry as seniors would require developmental math courses at MC. Based on the data in Table 4-1, we estimate that about 60 percent of the students recommended for developmental math courses were not actually repeating coursework that they had taken in high school. Rather, they were taking non-credit courses in college concerning material they had not studied in high school. About 40 percent of the students taking developmental math courses were reviewing material they studied at some time in high school.

Several demographic background indicators revealed significant differences in student placement rates for developmental math. For example, Table 4-1 shows that 66 percent of students who ever had free or reduced meals services in MCPS would, if tested, require developmental math courses compared to 40 percent of the seniors who had never had that service. In addition, 55 percent of the seniors who had ever had special educational services (at intensities 1, 2 or 3), compared to 39 percent with no such history, would require developmental math courses. And, 51 percent of the former ESOL students, versus 43 percent of the never-ESOL group, would require developmental math courses. There were only minor gender differences with 43 percent of females and 45 percent of males estimated to need developmental math work.

Racial/ethnic differences in developmental placement rate in math were considerable with Asian Americans estimated at 24 percent, African Americans at 68 percent, Hispanic students at 67 percent and white students at 39 percent. A more detailed analysis revealed that virtually all of these racial/ethnic group differences were due to the groups' differing profiles of high school course-taking and their background demographic differences (i.e. having received prior special education, ESOL or free meals services.) For example, the disparity in developmental math placement rate between white students and others, when statistically adjusted for those academic and background differences, was: for Asian students 4 percentage points; for African American students 7 percentage points; and for Hispanic students 6 percentage points. These minimal, statistically adjusted race group differences mean that students from similar demographic conditions who took the same level of high school math courses would, on average, have nearly the same developmental placement rates regardless of racial/ethnic group membership. The fact that the actual data show such large differences is due to the large racial/ethnic group differences in their academic transcripts and background conditions. For example, the average Asian senior graduated with trigonometry as the highest math course while the average African American or Hispanic senior graduated having taken one to one-and-one half years less of advanced math (i.e. attained geometry or intermediate algebra:) White seniors, on average, attained intermediate algebra or trigonometry.

SAT scores correlate significantly with the need for developmental math. An estimated 82 percent of the students who declined to take the SAT would require developmental placement compared to 29 percent of those who took the SAT. Among students who did take the SAT, each additional 10 points on the SAT Math score translated into a reduction of 2 percentage points in the likelihood of developmental placement. Also, we estimated that 36 percent of the students in MCPS with SAT Math scores at the national average (478 in 1993) would, if tested, require placement into developmental math courses at MC. Note that the average SAT Math score for the MCPS Class of 1993, at 527, was significantly higher than the national average. An MCPS student with a 527 SAT Math score would have a 16 percent likelihood of developmental math placement.

Findings on Reading Placement

MC recommends for developmental reading courses those students whose tested reading level is below the 11th grade. As with the math findings, there was wide variability in the estimated developmental reading placement rates, depending upon the student's level of academic preparation. The analysis estimated that about 3 out of 10 MCPS graduates would be placed into developmental reading courses, but among the students who were actually tested at MC, 41 percent required developmental reading courses. Among the 44 percent of all seniors presumably bound for college (because they had an SAT score on record) the estimated likelihood for developmental reading was only 13 percent.

Students vary considerably in the grade level of the English course taken in their senior year. Some students who have had ESOL courses or developmental reading courses earlier in high school may not attain a 12th grade English course by their senior year. For example, the data in Table 4-1 show that a total of 587 students (about 4 percent of the seniors) enrolled in a senior year English course on the 9th, 10th or 11th grade level. About two-thirds of that group

would likely need a developmental reading course at MC and one-third would not. Among the group who enrolled in a 12th grade English course while a senior (78 percent of the graduates), about one-third would likely be placed in a developmental reading course, and two-thirds would not. Finally, among the 14 percent of seniors who took an advanced placement course in 12th grade, only 3 percent were estimated to need a developmental reading course at MC.

Several demographic indicators were associated with estimated developmental reading placement. For example, 58 percent of students with some history of free or reduced meals, compared to 26 percent of those with no such history, were estimated to require developmental reading courses. Similar results were found for students with a history of ESOL services (54 percent) versus those with no such history (27 percent), and with a history of special education services (45 percent) versus with no such services (24 percent.)

Nonwhite students would be more likely than white students, if tested at MC, to be placed in developmental reading courses, and, as was true for math placement, most of those racial/ethnic differences are due to differences in prior coursework and background differences among the groups. For example, Asian American students had a 9 percentage point higher likelihood of developmental reading placement than did white students, but the difference between Asian and white students who graduated with the same level of coursework was only 5 percentage points. Or, Hispanic students differed from white students by an average of 27 percentage points, but when statistically adjusted for coursework differences, that difference shrank to only 5 percentage points. African American students averaged 27 percentage points higher in likelihood than white students, and when statistically adjusted for coursework differences, that difference was 11 percentage points. These results mean that white students, on average, tend to take higher levels of English coursework by the time they graduate than do other students.

The SAT Verbal score was an important predictor of the students' likelihood of needing to take developmental reading courses. Students who took the SAT at all averaged a 19 percent likelihood of placement in developmental reading compared to a 65 percent placement rate estimated for those who had not taken the SAT. MCPS graduates with the 1993 national average SAT Verbal score of 424 were estimated to have a likelihood of 25 percent placement rate in developmental reading. And, as with the math results, each additional 10 points in the SAT Verbal scale reduced the likelihood of developmental reading placement by about 2 percentage points. The senior with the MCPS average SAT Verbal score of 465 was estimated to have a 17 percent likelihood of developmental reading placement, and a zero likelihood of placement was estimated for students with an SAT Verbal score of 560.

Findings on English Placement

Results in Table 4-1 show that, across the two cohorts, 44 percent of the MCPS graduates tested at MC were placed into developmental English courses. That group accounted for about one-fifth of the MCPS graduates. And, of those enrollees who were not tested about 32 percent would likely be placed into developmental English courses if they were to be tested, based on their highest level of English course, class marks and SAT scores. Among the 45 percent of graduates who were college-bound seniors (those with SAT scores) not enrolling at MC, only about 13 percent would require developmental English courses. These widely-differing groups, when combined, produce an overall estimate of 31 percent developmental placement rate for the entire group of graduates.

Regarding the importance of academic factors, Table 4-1 shows that virtually no advanced placement students (comprising the top 14 percent of seniors) would require developmental English. On the other hand, about 62 percent of the seniors whose highest English course was grade 9, 10 or 11 (comprising roughly 5 percent of the graduates) would require developmental English courses at MC.

Several demographic background indicators revealed significant differences in student placement rates for developmental English. For example, Table 4-1 shows that 61 percent of students who ever had free or reduced meals services in MCPS would, if tested, require developmental English courses compared to 26 percent of the seniors who had never had that service. Also, 48 percent of the seniors who had ever had special educational services (at intensities 1, 2 or 3), compared to 23 percent of the never-special education group, and 58 percent of the former ESOL students, compared to 26 percent of the never-ESOL group, would require developmental English courses. Gender differences were small with fewer females (28 percent) than males (34 percent) requiring developmental English.

Racial/ethnic group differences in estimated developmental English course placement resembled those differences reported above for reading placement. Table 4-1 shows that Asian American students averaged 10 percentage points more likely than white students to require developmental English coursework. For Asian students graduating with the same level of English coursework as that of white students, the estimated difference was only 3 percentage points, with other background conditions being equal. African American seniors averaged 24 percentage points more likely than white students to require developmental English, and that difference shrank to an estimated 7 points for students from similar backgrounds and academic profiles. Hispanic seniors averaged 31 percentage points more likely than white students to require developmental English, but among students with similar backgrounds and academic coursework the difference was only 4 percentage points.

SAT Verbal scores also relate significantly to the need for developmental English coursework. For example, students who had not taken the SAT averaged a 65 percent likelihood of developmental English course placement. Among MCPS graduates with the national average SAT Verbal score of 424 the estimated likelihood was 24 percent. And, as with the reading results above, an estimated 17 percent of the students with the MCPS average SAT Verbal of 465 would require developmental English composition courses.

TABLE 4-1
Estimated Proportion of MCPS Graduates Who Would, If Tested, Be Placed In Developmental Math, Reading or English Courses at Montgomery College (Data from Graduating Classes of 1992 and 1993).

	DEVELOPMENTAL MATH		DEVELOPMENTAL READING		DEVELOPMENTAL ENGLISH	
	Mean	Count	Mean	Count	Mean	Count
GROUP TOTALS	.44	13575	.31	13575	.31	13575
COLLEGE/TEST PROFILE						
MC Enroll & Test	.59	2737	.41	2699	.43	2684
MC Enroll, No test	.43	2514	.32	2554	.32	2569
Other College	.22	6046	.13	6046	.13	6046
No SAT	.84	2276	.69	2276	.66	2276
GRADUATION YEAR						
1992	.42	6965	.33	6965	.30	6965
1993	.46	6610	.29	6610	.32	6610
GENDER						
Female	.43	6621	.30	6621	.28	6621
Male	.45	6954	.32	6954	.34	6954
RACE						
Am. Indian	.51	35	.28	35	.28	35
Asian Am.	.24	2148	.32	2148	.33	2148
African Am.	.68	2213	.50	2213	.47	2213
White	.39	8023	.23	8023	.23	8023
Hispanic	.67	1156	.50	1156	.54	1156
OLDER THAN GRADE?						
On grade-age	.36	9867	.23	9867	.22	9867
Older student	.65	3708	.52	3708	.55	3708
ESOL SERVICE						
None	.43	11466	.27	11466	.26	11466
Prior Svc.	.51	2109	.54	2109	.58	2109
SPEC.ED. SERVICE						
None	.39	9192	.24	9192	.23	9192
Prior Svc.	.55	4383	.45	4383	.48	4383
FREE/REDUCED MEALS						
None	.40	11618	.26	11618	.26	11618
Prior Svc.	.66	1957	.58	1957	.61	1957
HIGHEST ENGLISH						
9th Grade	.65	587	.55	587	.82	587
10th Grade	.69	210	.69	210	.64	210
11th Grade	.69	220	.65	220	.62	220
11 & 12th Grade	.49	3873	.33	3873	.34	3873
12th Grade	.45	6520	.33	6520	.31	6520
Honors/AP Courses	.08	1804	.03	1804	.01	1804
HIGHEST MATH						
Below Alg 1	1.00	901	.70	901	.75	901
Alg 1	.99	745	.64	745	.67	745
Geometry	.92	2106	.57	2106	.58	2106
Alg 2	.57	2837	.34	2837	.33	2837
Trig	.21	3150	.19	3150	.19	3150
Precalculus	.00	1557	.13	1557	.12	1557
Calculus	.00	2104	.08	2104	.07	2104
SAT GROUP						
No SAT	.82	3742	.65	3742	.65	3742
1 sd below USA	.75	1437	.66	1437	.61	1437
within 1 sd of USA	.30	5395	.17	5395	.17	5395
1 above USA	.04	2992	.00	2992	.01	2992

BEST COPY AVAILABLE

SECTION V

FIRST YEAR PERFORMANCE OF STUDENTS AT MONTGOMERY COLLEGE

MEASURES OF SUCCESS

This section of the report examines the academic success of members of the 1992 and 1993 senior classes of MCPS who enrolled in both the regular fall term and the spring term at MC in the year following their graduation. Note that this group is somewhat smaller than the groups reported in Section 3 that enrolled in either Fall or Spring term during their first year after high school graduation. This is because we wanted to study the year-long academic performance of the students. Several measures of academic success were available from the data:

- Cumulative grade point average (GPA) for credit-bearing courses at semester's end.
- Number of hours dropped since initial enrollment[3]
- Number of hours retained through the semester;
- Percentage of the retained, (credit bearing) hours which were successfully completed.

RESULTS

Overall success

Data in Table 5-1 show that 1,073 students from the 1992 senior class and 968 from the 1993 senior class enrolled at Montgomery College for both the fall and the spring terms following high school. Virtually all of these students attended full time, since the mean number of hours carried at third week for the academic year for both classes was 25. Several indicators suggest that the 1992 graduates were slightly more successful at MC than were the 1993 graduates. For example, over their first two semesters at MC the mean GPA for the former was slightly higher (2.26 compared to 2.15); the Class of 1992 dropped an average of 1.69 fewer hours, and they earned an average of 1.48 more credit hours than was true for the Class of 1993. Members of both classes successfully completed (i.e., earned a grade of "D" or higher) in only three-quarters of the credit (college-level) hours in which they were enrolled at the close of the semesters.

Demographic Differences in Success

Women in both classes experienced greater success than did men during their first year at MC. The mean GPA for women was higher, they earned more credits, and they completed a greater percentage of their hours attempted than was true for men.

Asian American and white students experienced slightly higher levels of success than did African-American and Hispanic students from the Class of 1993. Table 5-1 shows that Asian American and white students earned GPA's just over a "C" average while African American and

---

3 At Montgomery College although students may withdraw from a class through the eleventh week of classes, they receive refunds only for classes dropped during the first week. The "hours dropped" noted in Table 5-1 thus represent lost resources to the student. Tuition and fees for in-county students were about $58 per hour in 1992 and $64 per hour in 1993.

Hispanic students earned just under a "C" average. All groups earned credits in at least 70 percent of the courses they attempted, but Asian American (at 79 percent) and white students (at 77 percent) were somewhat higher than Hispanic and African American students (both at 70 percent.) African-American students in the Class of 1993 performed better than those in the class of 1992, producing a higher GPA and completing a greater percentage of the credit hours attempted. For the other three groups the Class of 1992 performed slightly better than did the Class of 1993.

Other demographic features were associated with first-year success. Students older than 18 during their senior year tended to perform less successfully at MC than those who were at grade age (18) during their senior year. Students who had been enrolled in ESOL classes in MCPS actually averaged a higher GPA than those who had not, and they completed as many or more of the courses attempted. It should also be noted that the grades those students earned in the ESL classes at MC were included in their GPA whereas that was not true for other students' developmental classes in English, math, and reading.

Students whose lower household income qualified them for the free or reduced meals program in MCPS dropped more hours during their first year at MC (5.69 hours) than did those who were not eligible for this program (3.18 hours). These dropped courses represent economic loss to the students. For example, the 6.95 hours dropped in 1993-94 by the students who had expereinced near-poverty at some time in high school amounted to an average of $445 per student that year. Assuming approximately 5 dollars per hour (after deductions) on a part-time job, that loss represents almost 90 hours of work for such a student. Other students that year averaged a loss of about $304 in tuition for dropped courses. Students eligible for free/reduced meals in the class of 1993 actually performed slightly better than those not eligible. Yet, those students earned fewer credit hours (12.26 hours) than did students who never received free meals benefits (16.36 hours earned.)

High School Academic Preparation

The most successful students in each class as measured by mean GPA, fewest hours dropped, most hours earned and greatest percentage of hours successfully completed were the students with the strongest academic records in English and math.[3] These students were enrolled in honors English classes and advanced math during their senior years. Students whose highest math class was less than algebra and those whose senior English class was a developmental one had the most difficulty at MC: They had the lowest GPAs (1.49 - 1.74), most number of hours dropped (12.77 - 7.17), and fewest number of hours successfully completed (5.15 - 9.74; between 59 and 63 percent of the credit hours attempted).

More than eighty percent of the seniors in each class who enrolled at MC completed regular eleventh or twelfth grade English in their senior year. These students earned mean GPA's of at least 2.0 and completed three-quarters of the credit hours attempted. However, the mean number of hours dropped was greater than 3 for the class of 1992 and even higher for the class of 1993.

---

3 English courses in Table 5-1 were categorized by the course descriptions appearing in the MCPS Course Bulletin. These categories, although different from those reported in Table 4-1, reveal essentially the same results as were found for the English courses categorized by grade level in Table 4-1.

About 83 percent of the MC students in each class completed geometry, algebra 2, or trigonometry as their highest level math class in high school, and 8 percent completed still higher levels of high school math. The groups of students who finished high school with successively higher levels of math courses tended also in MC to earn successively higher GPA's, to earn more credit hours, and to complete a higher percentage of credits attempted.

Placement Test Performance

Approximately 80 percent of this year-long group of students in each class completed the placement tests in reading and English composition. Students who did not take these tests were as successful at MC during their first year as were the students who demonstrated college level skills on these tests. Unassessed students either did not enroll in an English course (since testing is a prerequisite) or they presented high verbal SAT scores which exempted them from the placement tests. Students whose placement test performance was within the ranges indicating a need for developmental coursework were less successful. In general, students reading at less that the 9th grade level did not earn mean GPAs above 2.0. Similarly, students who performed within the developmental range on the English composition test also had mean GPAs below 2.0. It is likely that students whose assessed verbal skills are weak will have significant difficulty completing a program of study at the college level.

Students who did not complete the math placement test were similar to students placing into the higher developmental math class, MA015, on the various measures of academic success at Montgomery College. Unassessed students either did not enroll in a math course (since testing is a prerequisite) or they presented high math SAT scores which exempted them from the placement tests. Students whose demonstrated math skills are weak (MA014) have the lowest mean GPA in each class (1.72 and 1.83), drop the greatest number of hours, and earn the smallest percentage of hours attempted. The most successful students are those who perform well on the math placement test, entitling them to enroll in college level math courses, MA112 and higher. They completed more hours successfully, earning between 80 percent and 94 percent of the hours they attempted.

Additional Comments on Testing

When students from these two classes of MCPS entered Montgomery College the placement tests used were traditional paper and pencil tests, The Descriptive Test of Language Skills for English, the Nelson-Denny Test for reading, and a locally developed achievement test for math. In October, 1994, the College began using a computer-adapted series of placement tests, Accuplacer, which has been developed by the Educational Testing Service. Student performance levels on the Accuplacer may differ from those assessed using the older instruments.

In addition, the College has recently adopted a stronger policy on student assessment and enrollment in developmental classes. The findings cited above, concerning the lower class marks and lower class completion rates of students testing into the developmental classes, lend support for this new policy. This policy will require students to take the assessment tests and, if their test performance indicates a need, to enroll in the appropriate developmental classes. Beginning with the Spring 1995 semester, all first time college students who indicated they were pursuing a degree, whether from Montgomery College or from some other institution, must complete the assessment tests. This differs from the previous policy which focused primarily on

full-time students. It is anticipated that a greater number of students will be taking the assessment tests.

Description of Data in Table 5-1

In Table 5-1 the mean cumulative grade point average (*GPA*) and the number (*N*) of students included in that mean are the first two columns of data. Next, the mean number of hours, both credit and non-credit, in which the students are enrolled at the official third week date (*Hrs 3rd Wk*). Students have paid tuition and fees for these hours. At Montgomery College students have until the end of the eleventh week of classes to drop a course. The dropped courses are not included in the calculation of the GPA. The mean number of hours dropped (*Hrs Dropped*) is the fourth column of data and represents a measure of loss, in both time and money, to these students. This figure includes both credit and non-credit hours. After the eleventh week of classes students may no longer drop a course. All of these hours, both credit and non-credit, are considered to have been attempted by the students. The mean number of credit hours attempted (*Attempted Credit*) and of non-credit hours attempted (*Attempted Non-Cr*) are the next two columns of data. Finally, students who earn at least a "D" in a college-level, i.e., a credit-bearing, course earn those hours towards a degree. The mean number of hours earned (*Hrs Earned*) and the mean ratio of credit hours earned to credit hours attempted (*% Earned*) are the last two columns of data given for each class. That "% Earned" figure represents the average for the cohort, and cannot be calculated directly from the data reported elsewhere in the Table 5-1.

Table 5 - 1. Means of Selected Measures of Academic Success of MCPS Seniors during the First Year Following Graduation

Student Characteristic	1992-93 Academic Year Performance of Class of 1992								1993-94 Academic Year Performance of Class of 1993							
	N	GPA	Hrs 3rd Wk	Hrs Dropped	Attempted Credit	Attempted Non-Cr	Hrs Earned	% Earned	N	GPA	Hrs 3rd Wk	Hrs Dropped	Attempted Credit	Attempted Non-Cr	Hrs Earned	% Earned
Total Population	1073	2.26	25.03	3.59	19.41	2.16	15.68	77%	968	2.15	24.90	5.28	18.01	1.63	14.20	75%
Sex																
Female	536	2.40	25.21	3.92	19.54	1.84	16.37	81%	482	2.28	24.94	5.26	18.11	1.57	14.66	78%
Male	537	2.12	24.85	3.27	19.28	2.48	15.00	74%	486	2.01	24.86	5.29	17.92	1.69	13.74	73%
Race																
Amer In	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	2.90	27.50	7.00	19.00	1.50	17.50	92%
Asian	186	2.40	26.82	5.72	18.93	2.17	15.67	79%	178	2.32	26.02	6.02	18.41	1.65	14.99	79%
Afr Am	150	1.86	22.97	4.67	15.53	2.89	10.65	66%	168	1.93	23.72	6.55	15.30	1.87	11.24	70%
White	641	2.30	25.13	2.73	20.62	1.95	17.05	79%	512	2.19	25.14	4.23	19.44	1.50	15.58	77%
Hisp	96	2.29	24.22	3.58	18.27	2.36	14.35	76%	108	1.97	23.68	6.94	14.89	1.84	11.00	70%
Age																
Grade Age	756	2.35	25.28	2.93	20.41	2.05	16.98	80%	652	2.12	25.15	4.74	18.82	1.61	14.81	75%
Older	317	2.04	24.45	5.18	17.00	2.41	12.57	69%	316	2.19	24.39	6.37	16.37	1.66	12.96	76%
Any ESOL																
No	869	2.25	24.72	3.13	19.60	2.13	15.81	77%	712	2.08	24.70	4.71	18.32	1.68	14.22	74%
Yes	204	2.31	26.39	5.56	18.57	2.25	15.13	77%	256	2.32	25.44	6.84	17.16	1.48	14.15	80%
Any 123																
No	629	2.28	25.10	2.76	20.34	2.14	16.51	78%	517	2.10	24.82	4.58	18.65	1.60	14.66	74%
Yes	444	2.23	24.94	4.78	18.09	2.17	14.50	76%	451	2.20	24.99	6.07	17.29	1.66	13.68	77%
Any 456																
No	1021	2.27	25.23	3.39	19.78	2.18	16.05	77%	928	2.17	25.05	5.08	18.34	1.66	14.53	76%
Yes	52	1.94	21.06	7.61	11.92	1.73	8.31	71%	40	1.80	21.48	9.80	10.63	1.03	6.65	59%
Free/Reduced Meal																
No	896	2.28	25.07	3.18	19.96	2.07	16.36	79%	741	2.13	24.97	4.76	18.57	1.67	14.57	76%
Yes	177	2.12	24.85	5.69	16.62	2.61	12.26	70%	227	2.19	24.68	6.96	16.22	1.50	13.00	77%
Senior Yr English																
No English	8	1.64	20.22	4.25	14.38	1.13	10.13	70%	3	2.54	27.33	10.33	17.00	0.00	17.00	100%
Developmental	50	1.74	21.55	7.49	12.49	1.78	8.43	63%	26	1.53	21.35	12.77	8.08	0.50	5.15	65%
ESOL	32	2.44	26.22	7.00	17.34	1.88	14.94	81%	50	2.59	25.06	8.16	15.54	1.36	13.66	86%
LT 11th	42	2.26	26.60	6.02	18.51	2.10	14.63	74%	30	2.03	24.17	6.57	16.50	1.10	12.73	74%
Reg 11th	249	2.27	25.37	3.65	19.73	2.05	16.15	78%	362	2.16	24.96	4.59	18.49	1.93	14.55	75%
Honors 11th	20	2.66	26.62	1.10	24.40	1.10	22.00	90%	18	2.62	26.67	2.94	22.22	1.50	18.89	81%
Reg 12th	617	2.24	24.93	3.18	19.57	2.33	15.63	77%	447	2.07	24.94	5.18	18.17	1.59	14.04	74%
Honors/AP 12	55	2.77	26.11	1.56	23.05	1.78	20.24	86%	32	2.70	25.72	3.31	21.53	0.88	19.38	88%
Highest Math Taken																

BEST COPY AVAILABLE

Table 5 - 1. Means of Selected Measures of Academic Success of MCPS Seniors during the First Year Following Graduation

Student Characteristic	1992-93 Academic Year Performance of Class of 1992								1993-94 Academic Year Performance of Class of 1993							
	N	GPA	Hrs 3rd Wk	Hrs Dropped	Attempted Credit	Attempted Non-Cr	Hrs Earned	% Earned	N	GPA	Hrs 3rd Wk	Hrs Dropped	Attempted Credit	Attempted Non-Cr	Hrs Earned	% Earned
Total Population	1073	2.26	25.03	3.59	19.41	2.16	15.68	77%	968	2.15	24.90	5.28	18.01	1.63	14.20	75%
LT Alg	55	1.49	19.58	7.53	10.40	1.62	6.08	59%	39	1.68	20.85	9.59	10.08	1.18	6.44	62%
Alg I	41	1.63	22.67	7.17	13.27	2.24	8.12	60%	57	1.87	22.56	7.72	13.18	1.67	9.74	71%
Geo	286	1.95	23.70	4.52	16.96	2.35	12.51	71%	241	1.83	23.57	6.29	15.42	1.87	10.85	69%
Alg2-Adv Alg	374	2.31	25.14	2.67	20.10	2.53	16.06	77%	362	2.15	24.97	4.25	19.01	1.74	14.92	75%
Trig	228	2.62	26.91	2.02	23.17	1.79	20.55	87%	201	2.45	26.91	4.32	21.20	1.44	17.97	82%
Pre-Calc	61	2.82	28.39	5.02	22.38	1.00	20.57	90%	50	2.78	27.36	5.54	20.80	1.02	18.84	90%
Calc	28	2.92	28.69	3.57	23.82	1.50	21.75	89%	18	2.95	28.11	5.22	22.11	0.78	20.72	91%
Reading Assessment																
Not Assessed	220	2.39	25.58	3.91	19.54	2.18	16.06	79%	223	2.37	24.77	6.25	17.16	1.38	14.23	80%
LT 7th	97	1.93	23.56	8.08	14.07	1.40	10.71	74%	47	1.77	23.79	9.02	12.77	2.00	8.85	69%
7.0 - 8.9	114	1.86	24.10	5.18	16.18	2.86	11.34	66%	78	1.93	23.85	8.21	13.67	1.77	10.45	72%
9.0 - 10.9	189	2.21	25.26	4.88	18.35	2.15	14.72	76%	156	2.00	24.97	6.33	17.05	1.63	13.03	73%
11.0 - 12.4	112	2.30	25.30	2.92	20.50	2.10	17.21	80%	121	1.88	25.47	4.90	18.82	1.79	14.23	71%
GE 12.5	341	2.41	25.19	1.09	22.16	2.14	18.34	80%	343	2.26	25.14	3.12	20.39	1.65	16.30	77%
English Assessment																
Not Assessed	227	2.39	25.48	3.96	19.45	2.13	16.08	79%	224	2.37	24.79	6.34	17.09	1.38	14.17	80%
Cont Ed	14	1.66	25.79	10.79	11.93	3.07	6.64	53%	15	1.75	22.60	9.40	11.73	1.47	8.00	61%
EN001	302	1.92	23.68	6.61	15.04	2.14	10.96	70%	323	1.82	24.38	7.57	15.11	1.73	10.76	69%
EN101A	312	2.30	25.98	2.43	21.36	2.40	17.54	79%	199	2.15	25.66	3.74	20.10	1.80	16.11	78%
EN101	218	2.57	25.03	0.28	23.05	1.80	19.68	83%	207	2.43	25.27	1.69	22.03	1.59	18.27	79%
Math Assessment																
Not Assessed	261	2.18	24.14	3.70	18.47	2.06	14.65	76%	143	2.08	23.19	5.91	15.83	1.45	12.11	73%
MA014	125	1.72	22.37	7.19	13.54	1.89	9.31	64%	187	1.83	24.18	8.75	14.19	1.22	10.28	71%
MA015	251	2.13	24.66	2.93	19.18	2.67	14.67	73%	361	2.05	24.67	4.17	18.52	2.03	14.00	72%
MA112/114 +	314	2.45	25.78	2.20	21.47	2.18	18.07	82%	179	2.35	25.84	3.73	20.66	1.51	17.29	81%
Pre-Calc	77	2.56	27.85	4.57	21.62	1.87	18.77	84%	59	2.62	27.10	4.34	20.93	1.83	18.28	87%
Calc	45	3.04	29.62	4.87	23.89	0.87	22.73	94%	39	3.10	29.05	5.08	23.21	0.77	22.15	94%

Notes: N's are number of students' GPA's included in the calculation of the mean.

Hrs 3rd Wk - Mean number of hours, both credit and non-credit, in which the students are enrolled at the official count date.

Hrs Dropped - Mean number of hours dropped by students between the 3rd week official count date and the 11th week deadline for dropping classes.

Attempted - Mean number of hours, both credit and non-credit, in which the students are still enrolled after the 11th week deadline for dropping classes.

Hours Earned: Mean number of college level (credit-bearing) hours in which students received passing grades.

% Earned: Mean percentage of the credit-bearing hours attempted which have been earned (i.e., percentage passed).

BEST COPY AVAILABLE

REFERENCES

Abraham, Ansley A., Jr. (1992), College Remedial Studies: Institutional Practices in the SREB States, Atlanta, Georgia.

College Entrance Examination Board, Annual Survey of Colleges, 1986-87, Summary Statistics (1992, May), *Table 300 - Colleges and Universities Offering Remedial Instruction or Tutoring, by Type and Control of Institution: 1980-81 to 1991-92.*

Green, Patricia J., Dugoni, Bernard L., Ingels, Steven J., Camburn, Eric, Quinn, Peggy (1995, June), A Profile of the American High School Senior in 1992, Washington, D. C.

Hayes, Dianne Williams (1995, June 1), *Remedial Education: Whose Responsibility Is It?*, Black Issues in Higher Education.

Maryland Department of Economic and Employment Development, Office of Labor Market Analysis and Information. *1992 To 2005: People to Jobs*, (November, 1994)

Maryland Higher Education Commission (1996) *Data Book*. Annapolis, MD.

Roueche, John E. and Roueche, Suanne D. (1993) *Between a Rock and a Hard Place: The At-Risk Student in the Open-Door College*. Community College Press, Washington, D.C.

Sommerfeld, Meg (1995, April 12), *Who's Responsible? Taking Sides on Remedial Classes*. Education Week.

Sturtz, Alan J. and McCarroll, Judith A. (1993, May), *Placement Testing and Student Success: The First Intervening Variable*, paper presented at the Annual Forum of the Association for Institutional Research, Chicago, Illinois.

Wyatt, Monica (1992, September), *The Past, Present, and Future need for College Reading Courses in the U.S.*, Journal of Reading.